

SEQUENCE LISTING

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<151> 1998-11-02

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<170> PatentIn Ver. 2.1

<210> 1

<211> 23

<212> PRT

<213> Streptococcus pyogenes

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Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu
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Thr Asn Cys

<210> 2

<211> 58

<212> PRT

<213> Streptococcus pyogenes

<400> 2

Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
1 5 10 15

Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
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Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys

35 40 45

Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser
50 55

<210> 3
<211> 28
<212> PRT
<213> Streptococcus pyogenes

<400> 3
Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser
1 5 10 15

Glu Glu Ala Ala Val Val Lys Ala Asp Asn Ala Ala
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<210> 4
<211> 184
<212> PRT
<213> Streptococcus pyogenes

<400> 4
Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
1 5 10 15

Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
20 25 30

Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
35 40 45

Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
50 55 60

Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
65 70 75 80

Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
85 90 95

Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
100 105 110

Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
115 120 125

Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg
130 135 140

Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro Phe
145 150 155 160

Phe Thr Ala Ala Ala Leu Ala Ile Met Val Ser Thr Gly Val Leu Val
165 170 175

Val Ser Ser Lys Cys Lys Glu Asn
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<210> 5

<211> 141

<212> PRT

<213> Streptococcus pyogenes

<400> 5

Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
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Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
20 25 30

Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
35 40 45

Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
50 55 60

Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
65 70 75 80

Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
85 90 95

Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
100 105 110

Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
115 120 125

Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys
130 135 140

<210> 6
<211> 159
<212> PRT
<213> Streptococcus pyogenes

<400> 6
Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
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Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
20 25 30

Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
35 40 45

Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
50 55 60

Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
65 70 75 80

Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
85 90 95

Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
100 105 110

Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
115 120 125

Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg
130 135 140

Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro
145 150 155

<210> 7
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<212> PRT
<213> Streptococcus pyogenes

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Gly Leu Val Ala Val Ser Ala Ser Val Leu Val Gly Ser Thr Val Ser
20 25 30

Ala Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly
 35 40 45

 Thr Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg
 50 55 60

 Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp
 65 70 75 80

 Lys Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu
 85 90 95

 Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val
 100 105 110

 Val Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp
 115 120 125

 Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp
 130 135 140

 Asn Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu
 145 150 155 160

 Asp Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu
 165 170 175

 Arg Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro
 180 185 190

 Phe Phe Thr Ala Ala Leu Ala Ile Met Val Ser Thr Gly Val Leu
 195 200 205

 Val Val Ser Ser Lys Cys Lys Glu Asn
 210 215

<210> 8
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 <212> PRT
 <213> Streptococcus pyogenes

<400> 8
 Ser Ala Phe Gly Leu Val Ala Val Ser Ala Ser Val Val Leu Val Gly Ser
 1 5 10 15

Thr Val Ser Ala Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro

20 25 30

Asn Gly Gly Thr Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu
35 40 45

Ala Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala
50 55 60

Ile Glu Asp Lys Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp
65 70 75 80

Ala Leu Glu Ala Leu Ala Asp Gln Ala Asp Ala Leu Gln Ser Glu Glu
85 90 95

Ala Ala Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala
100 105 110

Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
115 120 125

Lys Ala Asp Asn Ala Ala Ser Asp Thr Leu Glu Ala Leu Ala Asp Gln
130 135 140

Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Lys Ala Asp Asn
145 150 155 160

Ala Ala Ser Asp Thr Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu
165 170 175

Gln Ser Glu Glu Ala Ala Val Val Lys Ala Asp Asn Ala Ala Ser Asp
180 185 190

Thr Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu
195 200 205

Ala Glu Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala Trp Gly Lys
210 215 220

Ala Ala Thr Pro Ile Ala Leu Asp Val Lys Lys Thr Lys Asp Thr Lys
225 230 235 240

Pro Val Val Lys Lys Glu Glu Arg Gln Asn Val Asn Thr Leu Pro Thr
245 250 255

Thr Gly Glu

<210> 9
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<212> PRT
<213> Streptococcus pyogenes

<400> 9
Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu
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Ile Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn Glu
20 25 30

Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys Glu
35 40 45

Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala Leu
50 55 60

Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Lys
65 70 75 80

Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr
85 90 95

Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn Ala
100 105 110

Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp Val
115 120 125

Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg Gln
130 135 140

Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu
145 150 155

<210> 10
<211> 271
<212> PRT
<213> Streptococcus pyogenes

<400> 10
Val Ser Ala Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn
1 5 10 15

Gly Gly Thr Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala
20 25 30

Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile
35 40 45

Glu Asp Lys Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala
50 55 60

Leu Glu Ala Leu Ala Asp Gln Ala Asp Ala Leu Gln Ser Glu Glu Ala
65 70 75 80

Ala Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu
85 90 95

Ala Asp Gln Ala Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Gln
100 105 110

Ser Asp Asn Ala Ala Gly Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr
115 120 125

Asp Ala Leu Gln Ser Glu Glu Ala Ser Val Val Lys Ala Asp Asn Ala
130 135 140

Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln
145 150 155 160

Ser Glu Glu Ala Ser Val Val Lys Ala Asp Asn Ala Ala Ser Asp Ala
165 170 175

Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala
180 185 190

Ala Val Val Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu
195 200 205

Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln
210 215 220

Ser Asp Asn Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile
225 230 235 240

Ala Leu Asp Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys
245 250 255

Glu Glu Arg Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu
260 265 270

<211> 167

<212> PRT

<213> Streptococcus pyogenes

<400> 11

Ala Ser Val Leu Val Gly Ser Thr Val Ser Ala Val Asp Ser Pro Ile

1 5 10 15

Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu Thr Asn Leu Leu

20 25 30

Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn Glu Glu Arg Ala Ile

35 40 45

Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys Glu Ala Thr Thr Ala

50 55 60

Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr

65 70 75 80

Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Lys Ala Asp Asn Ala

85 90 95

Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln

100 105 110

Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala

115 120 125

Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp Val Lys Lys Thr Lys

130 135 140

Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg Gln Asn Val Asn Thr

145 150 155 160

Leu Pro Thr Thr Gly Glu Glu

165

<210> 12

<211> 654

<212> DNA

<213> Streptococcus pyogenes

<400> 12

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cctcgaatta ttccaaatgg cggaacctta actaatcttc ttggcaatgc tccagaaaa 180

ctggcattac gtaatgaaga aagagccatt gatgaattaa aaaaacaagc tattgaggat 240
aaagaagcta cgacagctat agaagcagca agttcagatg ccttagaagc attagcgat 300
caaacagacg cttaataatc agaagaagct gcgggttgc aagcgataa cgctgctagt 360
gacgccttag aagcattggc gcatcaaaaca gacgctttac aatcagaaga agctgaagta 420
gttcaatcag ataacgctgc tagtgacgcc tggaaaaag cagcaactcc aatcgctta 480
gatgttaaga aaactaaaga tacaaaacct gtagttaaa aagaagaaag acaaaacgtt 540
aatacccttc ctacaactgg tgaagagtct aaccattct ttacagctgc tgcgcttgca 600
ataatggtaa gtacaggtgt gttagttgt agtcaaaagt gcaaagaaaa ttag 654

<210> 13

<211> 777

<212> DNA

<213> Streptococcus pyogenes

<400> 13

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gttgactcac ctatcgaaca gcctcgaatt attccaaatg gcggAACCTT aactaatctt 120
cttggcaatg ctccagaaaa actggcatta cgtaatgaag aaaggccat ttagtgaat 180
aaaaaacaag ctattgagga taaagaagct acgacagcta tagaagcagc aagttcagat 240
gccttagaag cattagcgga tcaagcagac gctttacaat cagaagaagc tgcatgttt 300
caatcagata acgctgctag tgacgcctt gaagcattgg cgatcaaac agacgcttt 360
caatcagaag aagctgcggt tgttaaagcg gataacgctg ctatgacac tttagaagca 420
ttggcggatc aaacagacgc tttacaatca gaagaagctg cggttgttaa agcggataac 480
gctgctagtgc acactttaga agcattggcg gatcaaacag acgctttaca atcagaagaa 540
gctgcggtttgc ttaaagcgga taacgctgct agtgcacatt tagaagcatt ggcggatcaa 600
acagacgctt tacaatcaga agaagctgaa gtagttcaat cagataacgc tgctgtgac 660
gcctggggaa aagcagcaac tccaatcgct ttagatgtta agaaaactaa agataaaaa 720
cctgttagtta aaaaagaaga aagacaaaaac gttaataccct ttcctacaac tggtaa 777

<210> 14

<211> 469

<212> DNA

<213> Streptococcus pyogenes

<400> 14

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ggcaatgctc cagaaaaact ggcattacgt aatgaagaaa gagccattga tgaattaaaa 120
aaacaagcta ttgaggataa ggaagctacg acagctatac aagcagcaag ttcagatgcc 180
ttagaagcat tagcggatca aacagacgct ttacaatcag aagaagctgc gggttgttaa 240
gcggataacg ctgctagtgc cgcccttagaa gcattggcg atcaaacaga cgctttacaa 300
tcagaagaag ctgaagtagt tcaatcagat aacgctgcta gtgacgcctg ggaaaaagca 360
gcaactccaa tcgctttaga tgttaagaaa actaaagata caaaacctgt agtaaaaaaaa 420
gaagaaaagac aaaacgttaa tacccttcct acaactggtg aagagtaac 469

<210> 15

<211> 853
<212> DNA
<213> Streptococcus pyogenes

<400> 15
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gaacagccctc gaattattcc aaatggcgga accttaacta atcttcttgg caatgctcca 120
aaaaaaactgg cattacgtaa tgaagaaaga gccattgatg aataaaaaaaa acaagctatt 180
gaggataaag aagctacgac agctatagaa gcagcaagtt cagatgcctt agaagcatta 240
gcggatcaag cagacgcttt acaatcagaa gaagctgcag tagttcaatc agataacgct 300
gctagtgacg ccttagaagc attagcggat caagcagacg ctttacaatc agaagaagct 360
gcagtagttc aatcagataa cgctgctgg gacgccttag aagcattggc ggatcaaaca 420
gacgctttac aatcagaaga agcttcgggtt gttaaagcgg ataacgctgc tagtgacgcc 480
ttagaagcat tggcggatca aacagacgct ttacaatcag aagaagcttc ggttgtaaa 540
gcggataacg ctgctagtga cgccttagaa gcattggcgg atcaaacaga cgctttacaa 600
tcagaagaag ctgcggtgtt taaagcggat aacgctgcta gtgacgcctt agaagcattg 660
gcggatcaaa cagacgcttt acaatcagaa gaagctgaag tagttcaatc agataacgct 720
gctagtgacg cctggaaaaa agcagcaact ccaatcgctt tagatgttaa gaaaactaaa 780
gataaaaaac ctgtagttaa aaaagaagaa agacaaaaacg ttaataccct tcctacaact 840
ggtgaagagt aac 853

<210> 16
<211> 504
<212> DNA
<213> Streptococcus pyogenes

<400> 16
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attattccaa atggcggAAC cttaactaat cttcttggca atgctccaga aaaactggca 120
ttacgtaatg aagaaagagc cattgatgaa ttaaaaaaac aagctattga ggataaagaa 180
gctacgacag ctatagaagc agcaagttca gatgccttag aagcattagc ggatcaaaca 240
gacgctttac aatcagaaga agcttcgggtt gttaaagcgg ataacgctgc tagtgacgcc 300
ttagaagcat tggcggatca aacagacgct ttacaatcag aagaagctga agtagttcaa 360
tcagataacg ctgctagtga cgcctggaa aaaggcagcaa ctccaatcgc tttagatgtt 420
aagaaaaacta aagataaaaaa acctgttagtt aaaaaagaag aaagacaaaaa cgtaataacc 480
cttcctacaa ctggtgaaga gtAA 504

<210> 17
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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24

<210> 18
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 18
agcttttgg a ttagttgcgg tgtcagc

27

<210> 19
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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ttgactcacc tatcgaacag cctcg

25

<210> 20
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

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aaaacctgta gttaaaaaag aagaaagaca aa

32

<210> 21
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 21

ccttcctaca actggtaag ag

22

<210> 22

<211> 19

<212> PRT

<213> Streptococcus pyogenes

<400> 22

Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu

1

5

10

15

Thr Asn Cys

<210> 23

<211> 25

<212> PRT

<213> Streptococcus pyogenes

<400> 23

Glu Lys Leu Ala Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys

1

5

10

15

Lys Gln Ala Ile Glu Asp Lys Glu Cys

20

25

<210> 24

<211> 19

<212> PRT

<213> Streptococcus pyogenes

<400> 24

Glu Lys Leu Ala Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys

1

5

10

15

Lys Gln Cys

<210> 25

<211> 18

<212> PRT

<213> Streptococcus pyogenes

<400> 25

Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
1 5 10 15

Glu Cys

<210> 26

<211> 20

<212> PRT

<213> Streptococcus pyogenes

<400> 26

Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg Gln
1 5 10 15

Asn Val Asn Cys

20

Protein sequence from UniProtKB/Swiss-Prot entry P00931
and other entries